

AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

LISTING OF CLAIMS:

1. (CURRENTLY AMENDED) A magnetic head ~~having an air bearing surface (ABS)~~, comprising:
an antiparallel (AP) pinned layer structure;
a bias layer spaced apart from the AP pinned layer structure, a magnetic moment of the bias layer being pinned; and
a free layer positioned between the AP pinned layer structure and the bias layer;
wherein the bias layer provides magnetic stability to the free layer,
wherein the AP pinned layer structure has a positive magentostriction,
wherein the bias layer has a negative magnetostriction.
2. (ORIGINAL) A head as recited in claim 1, wherein the AP pinned layer structure includes at least two pinned layers having magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer.
3. (ORIGINAL) A head as recited in claim 2, wherein a thickness of the AP coupling layer and thicknesses of the pinned layers are selected to provide a saturation field above about 10 KOe.
4. (CURRENTLY AMENDED) A head as recited in claim 2, ~~wherein the AP pinned layer structure has a positive magnetostriction,~~ the AP pinned layer structure having a magnetic anisotropy oriented perpendicular to an ABS of the ~~reading~~ head.

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5. (CURRENTLY AMENDED) A head as recited in claim 1, wherein the bias layer has a negative magnetostriiction, wherein a magnetic moment of the bias layer is pinned parallel to a track width of the reading head.
6. (ORIGINAL) A head as recited in claim 1, wherein a magnetic thickness of the bias layer is about the same as a magnetic thickness of the free layer for creating a flux closed structure.
7. (CURRENTLY AMENDED) A magnetic head as recited in claim 1 comprising, an antiparallel (AP) pinned layer structure; a bias layer spaced apart from the AP pinned layer structure, a magnetic moment of the bias layer being pinned; and a free layer positioned between the AP pinned layer structure and the bias layer; wherein the bias layer provides magnetic stability to the free layer, wherein the bias layer comprises NiFe, wherein a ratio of Ni/Fe in the bias layer is at least about 9/1.
8. CURRENTLY AMENDED) A magnetic head as recited in claim 1 comprising, an antiparallel (AP) pinned layer structure; a bias layer spaced apart from the AP pinned layer structure, a magnetic moment of the bias layer being pinned; and a free layer positioned between the AP pinned layer structure and the bias layer; wherein the bias layer provides magnetic stability to the free layer, wherein the bias layer comprises CoNiNb.
9. (ORIGINAL) A head as recited in claim 1, wherein a magnetic moment of the bias layer is oriented antiparallel to the magnetic moment of the free layer.
10. (ORIGINAL) A head as recited in claim 1, wherein the head forms part of a GMR head.

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11. (ORIGINAL) A head as recited in claim 1, wherein the head forms part of a CPP GMR sensor.
12. (ORIGINAL) A head as recited in claim 1, wherein the head forms part of a CIP GMR sensor.
13. (ORIGINAL) A head as recited in claim 1, wherein the head forms part of a tunnel valve sensor.
14. (CURRENTLY AMENDED) A magnetic head ~~having an air bearing surface~~ (ABS), comprising:
 - an antiparallel (AP) pinned layer structure having two pinned layers having magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer;
 - a bias layer spaced apart from the AP pinned layer structure, a magnetic moment of the bias layer being pinned; and
 - a free layer positioned between the AP pinned layer structure and the bias layer, the free layer having a magnetic moment oriented antiparallel to the magnetic moment of the bias layer and perpendicular to magnetic moments of the pinned layers;

wherein the bias layer provides magnetic stability to the free layer,
wherein the AP pinned layer structure has a positive magentostriiction,
wherein the bias layer has a negative magnetostriction.
15. (ORIGINAL) A head as recited in claim 14, wherein a thickness of the AP coupling layer and thicknesses of the pinned layers are selected to provide a saturation field above about 10 KOe.

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16. (CURRENTLY AMENDED) A head as recited in claim 14, ~~wherein the AP pinned layer structure has a positive magnetostriction;~~ the AP pinned layer structure having a magnetic anisotropy oriented perpendicular to an ABS of the reading head.
17. (CURRENTLY AMENDED) A head as recited in claim 14, ~~wherein the bias layer has a negative magnetostriction;~~ wherein a magnetic moment of the bias layer is pinned parallel to a track width of the reading head.
18. (ORIGINAL) A head as recited in claim 14, wherein a magnetic thickness of the bias layer is about the same as a magnetic thickness of the free layer for creating a flux closed structure.
19. (CURRENTLY AMENDED) A magnetic head as recited in claim 14,
comprising an antiparallel (AP) pinned layer structure having two pinned layers
having magnetic moments that are self-pinned antiparallel to each other, the
pinned layers being separated by an AP coupling layer; a bias layer spaced apart
from the AP pinned layer structure; a magnetic moment of the bias layer being
pinned; and a free layer positioned between the AP pinned layer structure and
the bias layer, the free layer having a magnetic moment oriented antiparallel to
the magnetic moment of the bias layer and perpendicular to magnetic moments
of the pinned layers; wherein the bias layer provides magnetic stability to the
free layer, wherein the bias layer comprises NiFe, wherein a ratio of Ni/Fe in the bias layer is at least about 9/1.
20. (CURRENTLY AMENDED) A magnetic head as recited in claim 14,
comprising an antiparallel (AP) pinned layer structure having two pinned layers
having magnetic moments that are self-pinned antiparallel to each other, the
pinned layers being separated by an AP coupling layer; a bias layer spaced apart

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from the AP pinned layer structure, a magnetic moment of the bias layer being pinned; and a free layer positioned between the AP pinned layer structure and the bias layer, the free layer having a magnetic moment oriented antiparallel to the magnetic moment of the bias layer and perpendicular to magnetic moments of the pinned layers; wherein the bias layer provides magnetic stability to the free layer, wherein the bias layer comprises CoNiNb.

21. (ORIGINAL) A head as recited in claim 14, wherein the head forms part of a GMR head.
22. (ORIGINAL) A head as recited in claim 14, wherein the head forms part of a CPP GMR sensor.
23. (ORIGINAL) A head as recited in claim 14, wherein the head forms part of a CIP GMR sensor.
24. (ORIGINAL) A head as recited in claim 14, wherein the head forms part of a tunnel valve sensor.
25. (ORIGINAL) A magnetic storage system, comprising:
 - magnetic media;
 - at least one head for reading from and writing to the magnetic media, each head having:
 - a sensor having the structure recited in claim 1;
 - a write element coupled to the sensor;
 - a slider for supporting the head; and
 - a control unit coupled to the head for controlling operation of the head.

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